

# MAINTAINING THE NATIVE PLANT COMMUNITY DURING LONGLEAF PINE (*Pinus palustris* Mill.) ESTABLISHMENT

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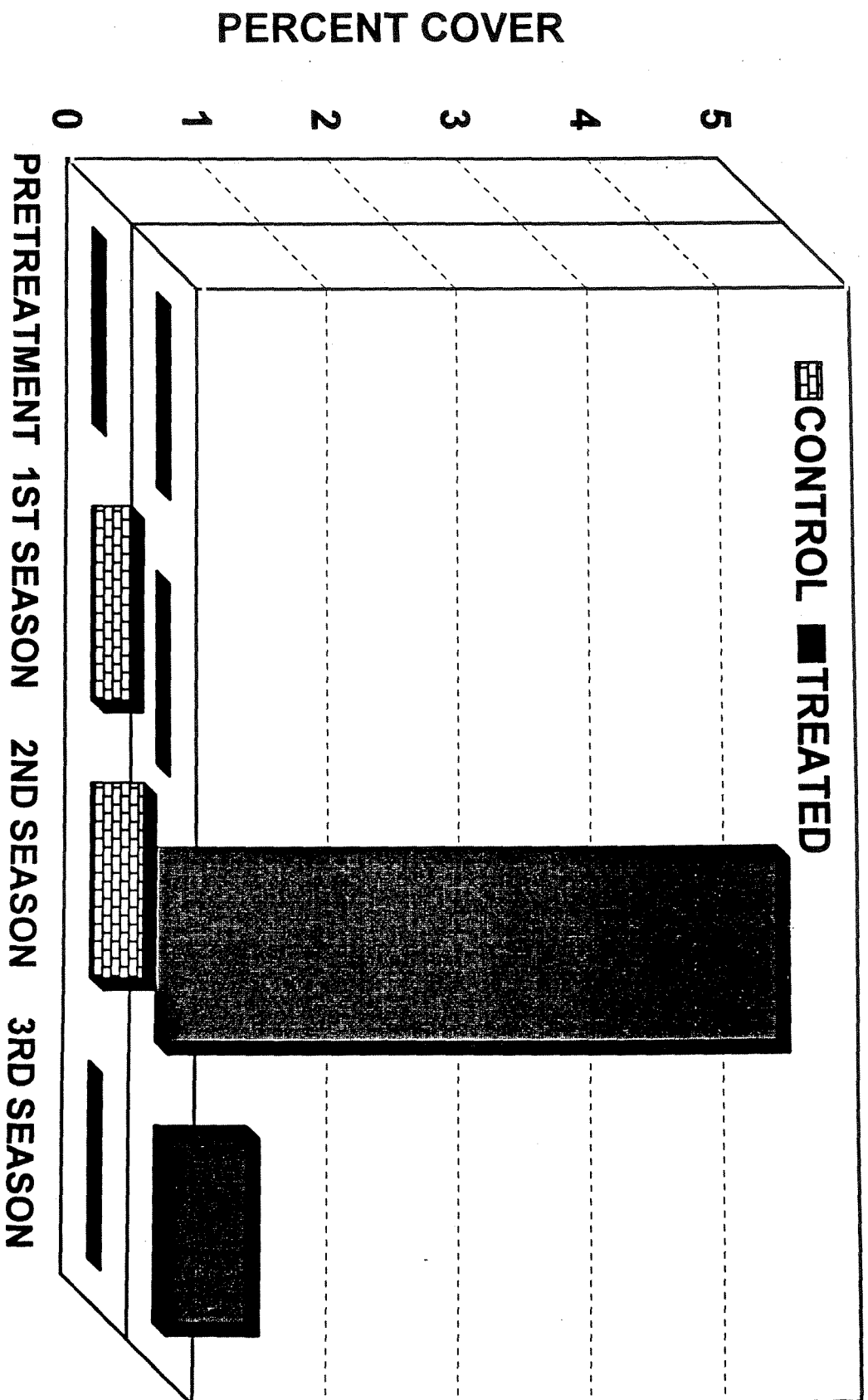
## SUMMARY

Site preparation treatments were evaluated to determine which were useful for establishing longleaf pine seedlings without excessive long-term damage to the native understory. Hexazinone treatments of 1.1 to 2.2 kg/ha were sufficient to reduce woody competition and allow the successful establishment of longleaf seedlings using hand planting of containerized stock. Hexazinone at rates of 2.2 kg/ha followed by strip scalping and machine planting resulted in slightly higher seedling survival rates. Although there was some initial exposure of soil and a decline in grass cover, the understory soon recovered. Thus, this treatment can be used to re-establish longleaf without undue damage to the understory.

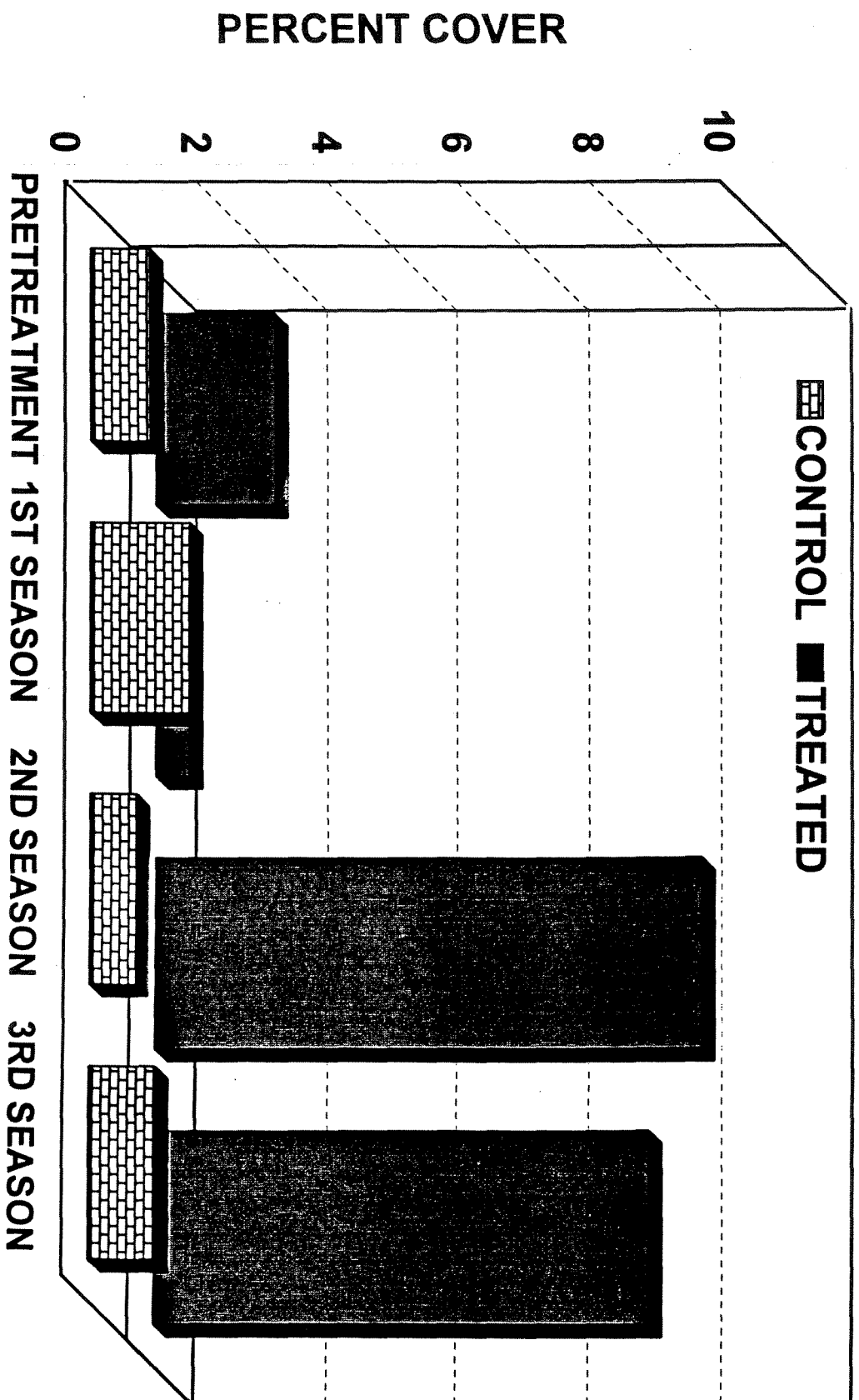
## INTRODUCTION

Longleaf pine is the key tree species in a complex of fire-dependent ecosystems long native to the southeastern United States (1). It once occupied perhaps as much as 25 million hectares, stretching from southeastern Virginia south to central Florida and west into eastern Texas (2). These forests have been intensively exploited since colonial times with little regard for regeneration. Currently only 1.3 million hectares of longleaf pine forest remain. The continuing reduction of this important forest type carries with it a risk to the myriad of life forms characteristic of and largely dependent on longleaf pine ecosystems. The diversity of ground cover plants per unit area places longleaf pine ecosystems among the most species-rich plant communities outside the Tropics. Extreme habitat reduction is the main cause for the precarious state of at least 191 taxa of vascular plants (3).

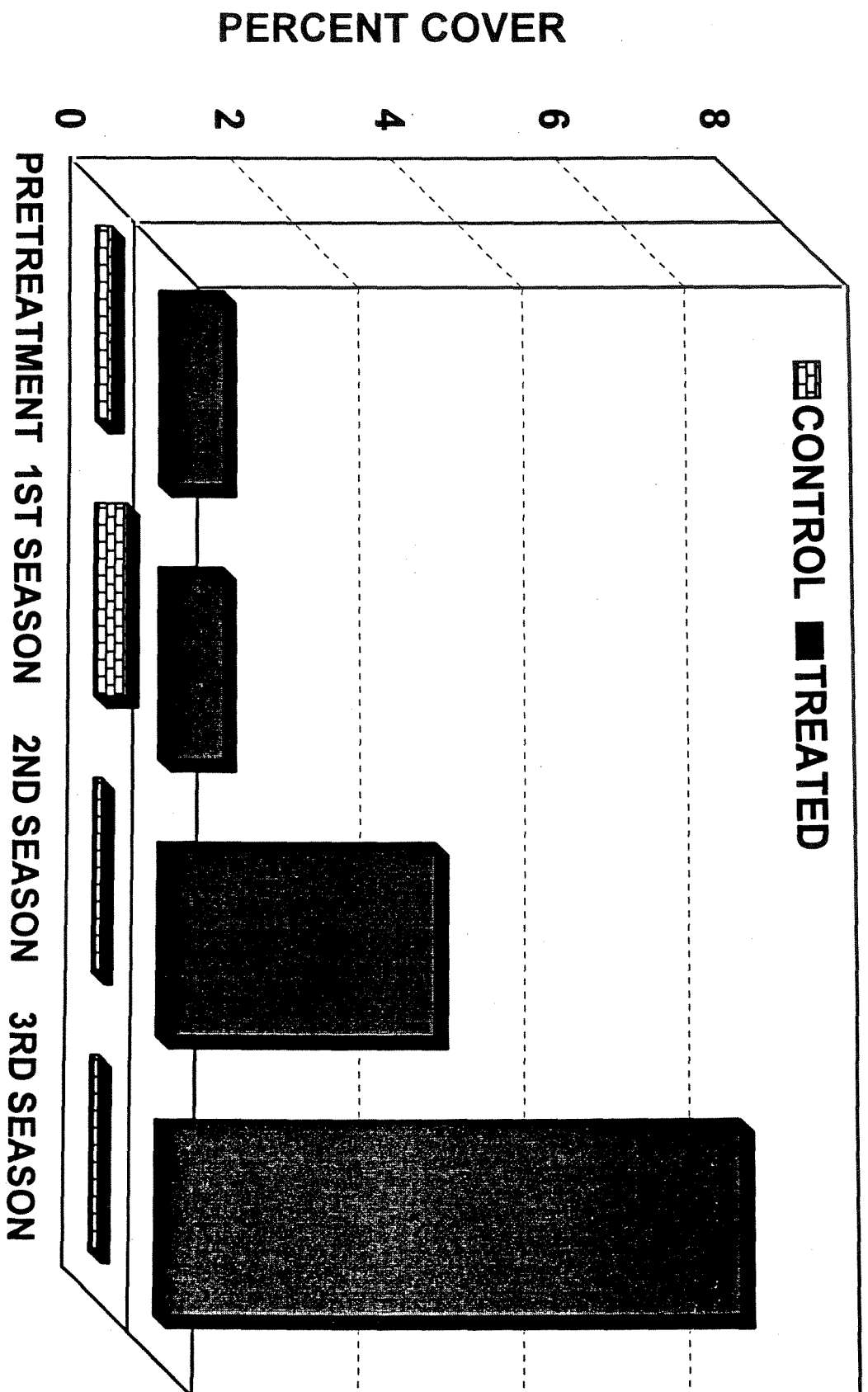
The need to re-establish longleaf on former sites is now widely recognized. It is believed that native understory grasses, especially wiregrass (*Aristida stricta*) and woody shrubs can be strong competitors during the regeneration phase. Numerous mechanical site preparation systems have been used to reduce competition prior to planting longleaf seedlings. These were quite effective in increasing seedling survival but they also resulted in significant reductions in the native understory grasses. Two passes with a double drum chopper, for example, will nearly eliminate wiregrass from dry sites (4) and will severely reduce it on wet flatwoods sites (5). All soil-disturbing site preparation methods reduce wiregrass cover, and it does not seem to recover even after long periods of time (6). Using selective herbicides for site preparation appears to cause less long-term damage to the understory (7). The purpose of this study was to evaluate site preparation treatments to determine if alternative techniques could be found which were successful in both re-establishing longleaf and maintaining the native understory plant community.



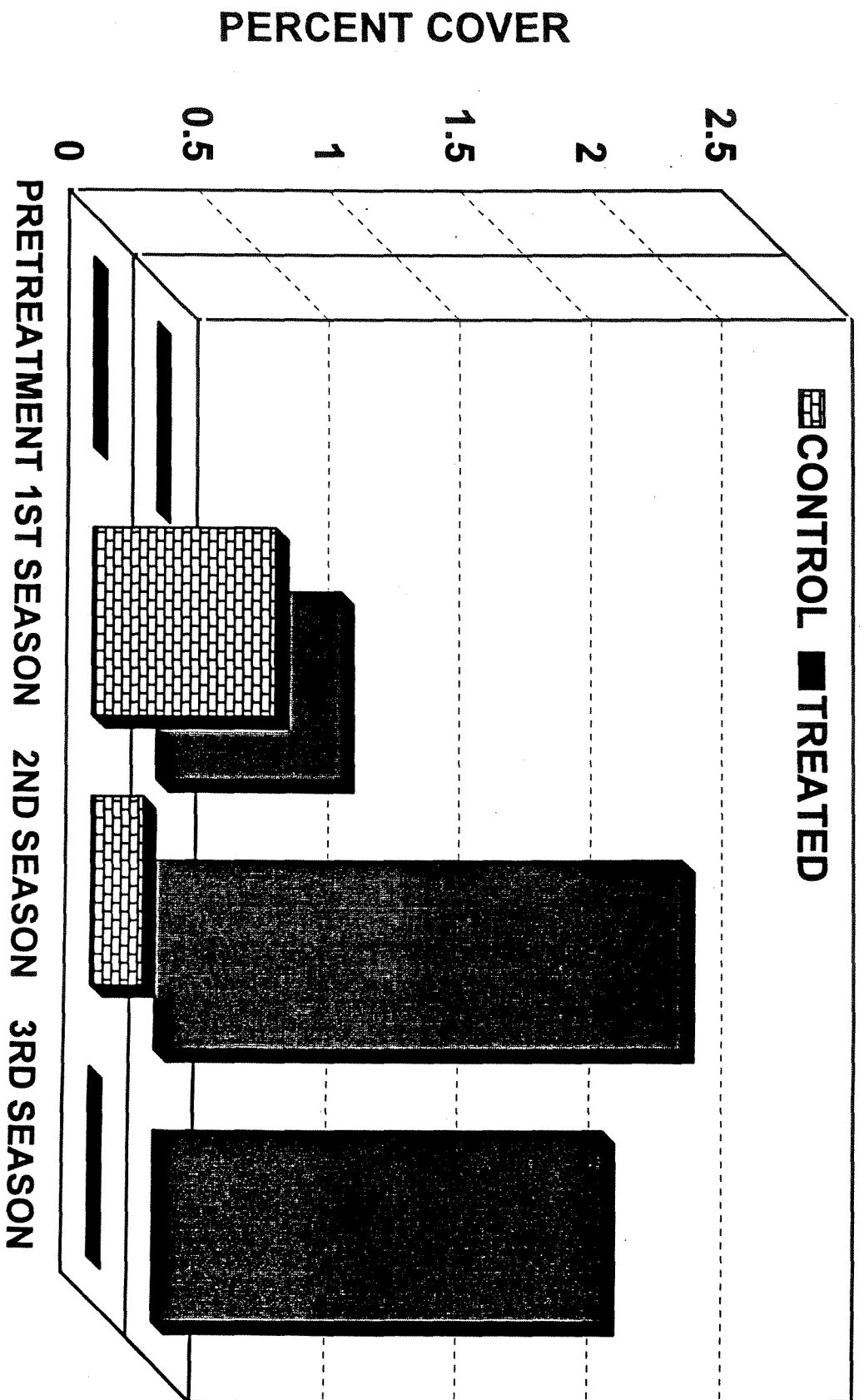
**FIGURE 7. Change in *Baldovina angustifolia* cover over time on operational Hexazinone treated and control areas.**



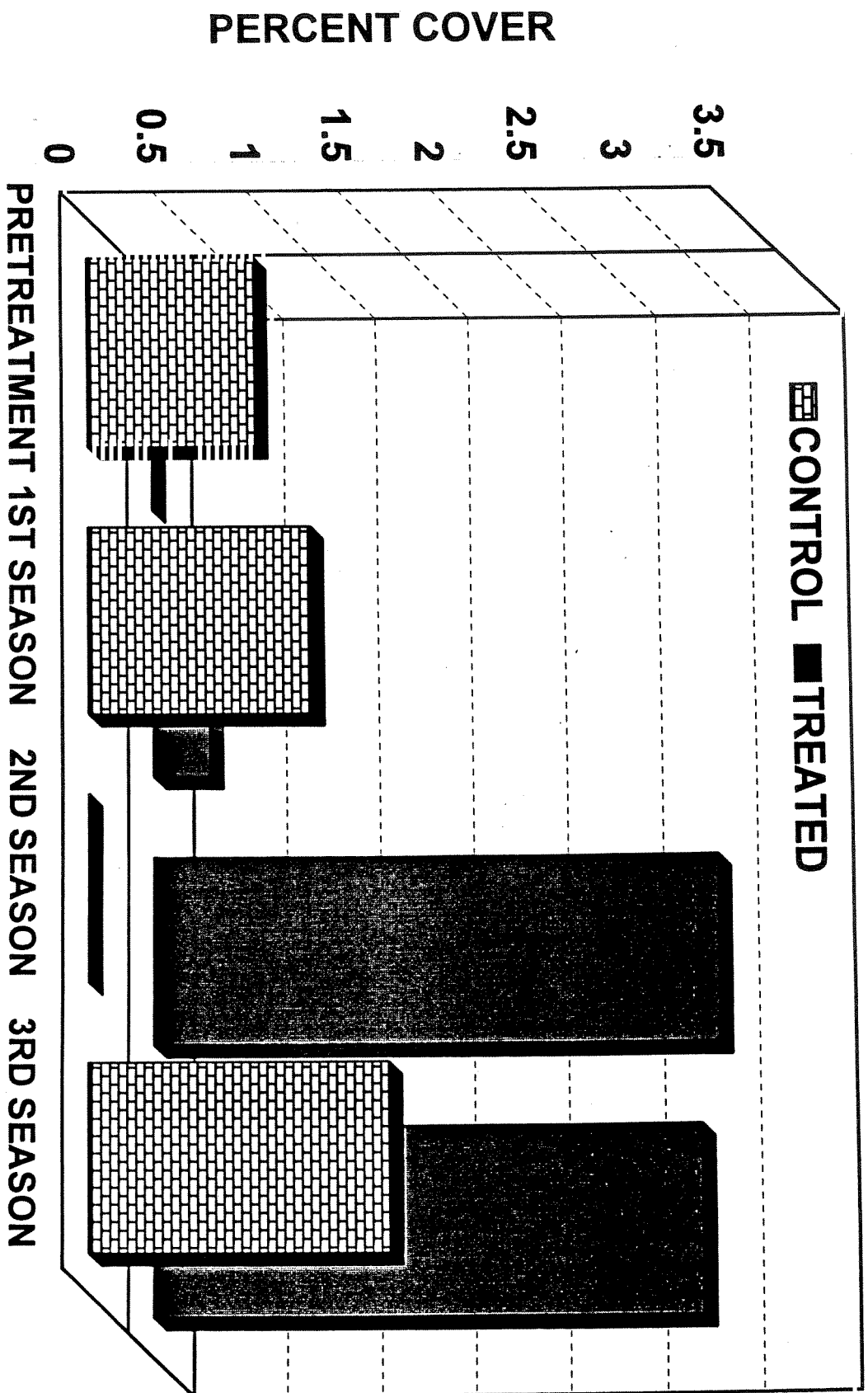
**FIGURE 8. Change in Eupatorium compositifolium cover over time on operational Hexazinone treated and control areas.**



**FIGURE 9.** Change in *Pityopsis graminifolia* cover over time on treated operational Hexazinone treated and control areas.



**FIGURE 10. Change in *Polygonella gracilis* cover over time on operational Hexazinone treated and control areas.**



**FIGURE 11. Change in Sorghastrum secundum cover over time on operational Hexazinone treated and control areas.**

# EFFECT OF HEXAZINONE AND V-BLADE PLANTING ON IMPORTANCE VALUE OF DOMINANT PLANT SPECIES.

PRETREATMENT	FIRST SEASON	SECOND SEASON	THIRD SEASON
		Block I	
<i>Aristida stricta</i>	96.0 <i>Aristida stricta</i>	73.6 <i>Aristida stricta</i>	74.1 <i>Aristida stricta</i>
<i>Quercus laevis</i>	17.7 Bare soil	32.7 Bare soil	14.3 <i>Polygonella gracilis</i>
<i>Andropogon virginicus</i>	14.7 <i>Andropogon virginicus</i>	11.3 <i>Polygonella gracilis</i>	12.3 Bare soil
<i>Galactia elliptica</i>	9.1 <i>Pityopsis graminifolia</i>	9.5 <i>Pityopsis graminifolia</i>	9.1 <i>Pityopsis graminifolia</i>
<i>Eupatorium compositifolium</i>	8.8 <i>Polygonella gracilis</i>	8.1 <i>Andropogon virginicus</i>	6.0 <i>Quercus laevis</i>
<i>Eriogonum tomentosum</i>	6.7 <i>Quercus laevis</i>	7.4 <i>Rhynchosia reniformis</i>	5.6 <i>Eupatorium compositifolium</i>
<i>Panicum spp.</i>	5.1 <i>Bulbostylis wari</i>	5.5 <i>Quercus laevis</i>	5.2 <i>Agalinus spp.</i>
			7.5
		Block II	
<i>Aristida stricta</i>	81.2 Bare soil	65.0 <i>Aristida stricta</i>	48.6 <i>Aristida stricta</i>
<i>Quercus laevis</i>	20.4 <i>Aristida stricta</i>	59.8 <i>Eupatorium compositifolium</i>	19.2 <i>Eupatorium compositifolium</i>
<i>Andropogon virginicus</i>	19.1 <i>Andropogon virginicus</i>	12.4 <i>Triplasis spp.</i>	15.1 Bare soil
<i>Pityopsis graminifolia</i>	9.0 <i>Licania michauxii</i>	6.8 Bare soil	11.1 <i>Andropogon virginicus</i>
<i>Lyonia ferruginea</i>	7.5 <i>Bulbostylis wari</i>	6.1 <i>Sorghastrum secundum</i>	10.1 <i>Conyza canadensis</i>
<i>Panicum spp.</i>	6.5 <i>Aristida purpurens</i>	5.9 <i>Pityopsis graminifolia</i>	9.4 <i>Pityopsis graminifolia</i>
<i>Licania michauxii</i>	5.4 <i>Pityopsis graminifolia</i>	4.7 <i>Balduina angustifolia</i>	8.8 <i>Triplasis spp.</i>
			8.8

# Block III

*Aristida stricta*  
*Quercus laevis*  
*Aristida purpurescens*  
*Andropogon virginicus*  
*Panicum* spp.  
*Ceratiola ericoides*  
*Galactia elliptica*

60.3 Bare soil  
20.2 *Aristida stricta*  
18.1 *Andropogon virginicus*  
16.8 *Aristida purpurescens*  
12.1 *Eupatorium compositifolium*  
11.1 *Panicum* spp.  
10.2 *Sabal etonia*

71.5 *Aristida stricta*  
43.5 *Bulbostylis wari*  
16.2 *Eupatorium compositifolium*  
14.2 *Andropogon virginicus*  
8.5 Bare soil  
6.1 *Aristida purpurescens*  
6.0 *Balduina angustifolia*

33.4 *Aristida stricta*  
18.8 *Aristida purpurescens*  
14.5 *Pityopsis graminifolia*  
13.8 *Eupatorium compositifolium*  
13.8 *Andropogon virginicus*  
13.7 *Bulbostylis wari*  
12.8 *Panicum* spp.

35.5  
24.4  
17.1  
14.4  
13.6  
10.2  
9.9